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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO
09/915,717	07/26/2001	Robert C. Boman	9432-000138	6563
27572	7590 09/21/2004		EXAMINER	
HARNESS, DICKEY & PIERCE, P.L.C. P.O. BOX 828			JACKSON, JAKIEDA R	
BLOOMFIELD HILLS, MI 48303			ART UNIT	PAPER NUMBER
			2655	

DATE MAILED: 09/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)			
Office Action Comme	09/915,717	BOMAN ET AL.			
Office Action Summary	Examiner	Art Unit			
	Jakieda R Jackson	2655			
The MAILING DATE of this communication appe Period for Reply	ears on the cover sheet with the	correspondence address			
A SHORTENED STATUTORY PERIOD FOR REPLY THE MAILING DATE OF THIS COMMUNICATION. - Extensions of time may be available under the provisions of 37 CFR 1.13 after SIX (6) MONTHS from the mailing date of this communication. - If the period for reply specified above is less than thirty (30) days, a reply If NO period for reply is specified above, the maximum statutory period with the set or extended period for reply will, by statute, Any reply received by the Office later than three months after the mailing earned patent term adjustment. See 37 CFR 1.704(b).	6(a). In no event, however, may a reply be ti within the statutory minimum of thirty (30) da ill apply and will expire SIX (6) MONTHS fron cause the application to become ABANDONE	mely filed ys will be considered timely. n the mailing date of this communication. ED (35 U S C 8 133)			
Status					
1) Responsive to communication(s) filed on					
2a) ☐ This action is FINAL . 2b) ☑ This					
3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is					
closed in accordance with the practice under Ex	x parte Quayle, 1935 C.D. 11, 4	53 O.G. 213.			
Disposition of Claims					
 4) ☐ Claim(s) 1-5 is/are pending in the application. 4a) Of the above claim(s) is/are withdraw 5) ☐ Claim(s) is/are allowed. 	n from consideration.				
6)⊠ Claim(s) <u>1-5</u> is/are rejected.		4.5			
7) Claim(s) is/are objected to.		* · ·			
8) Claim(s) are subject to restriction and/or	election requirement.	•			
Application Papers					
9)☐ The specification is objected to by the Examiner. 10)☑ The drawing(s) filed on 26 July 2001 is/are: a)☑ Applicant may not request that any objection to the	accepted or b) objected to I				
Applicant may not request that any objection to the d Replacement drawing sheet(s) including the correction					
11) The oath or declaration is objected to by the Exa	aminer. Note the attached Office	e Action or form PTO-152.			
Priority under 35 U.S.C. § 119					
12) Acknowledgment is made of a claim for foreign p a) All b) Some * c) None of: 1. Certified copies of the priority documents 2. Certified copies of the priority documents 3. Copies of the certified copies of the priority application from the International Bureau	have been received. have been received in Applicati ty documents have been receive	ion No			
* See the attached detailed Office action for a list of	f the certified copies not receive	ed.			
14 J 4(-)					
Attachment(s) Notice of References Cited (PTO-892)	4) 🖂 (-1	(PTO 442)			
Notice of Draftsperson's Patent Drawing Review (PTO-948)	4)	ate			
Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date	5) Notice of Informal P 6) Other:	Patent Application (PTO-152)			

DETAILED ACTION

Claim Rejections - 35 USC § 103

- 1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
 - (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
- 2. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morin et al. (U.S. Patent No. 6,230,129), hereinafter referenced as Morin in view of Gandhi et al. (U.S. Patent No. 5,687,287), hereinafter referenced as Gandhi.

Regarding **claims 1 and 5**, Morin discloses a speech recognition processor and method for processing an input speech utterance in a speech recognition system (figure 1), comprising:

a spectral measure module (figure 5) receptive of the input speech utterance (input speech; figure 5) for computing spectral measures of the input speech utterance for predetermined time frames (predefined number of segments; column 3, lines 31-34);

a time spectral pattern stage (figure 5) for concatenating (associating) a plurality of successive spectral measures for generating a spectral pattern vector (word model represented by vector; column 3, lines 35-40);

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a normalization module (normalize phoneme similarity) which accesses normalized values computed based upon training utterances (training speech/utterance), said normalization module finding (data found) corresponding normalized values for each said initial raw similarity value (utterance of training speech) to provide a normalized similarity value (phoneme similarity value is normalized) and concatenating normalized similarity values to form a similarity vector (vector summation values), said initial raw similarity value concatenating the initial raw similarity values to form a similarity vector (column 2, lines 21-52 with column 4, lines 58-61); and

a word matcher module for comparing said similarity vector (similarity between speech utterance) with pre-stored reference vectors (standard phonemes; column 3, lines 16-20), but lacks a linear discriminant module.

Gandhi discloses a speech recognition processor and method comprising: a linear discriminant module (linear discriminant function) for computing an initial raw similarity value for each sound classification unit (speaker speaking word which discriminate between two classes; column 5, lines 25-49) by computing the dot product of a linear discriminant vector (dot product; column 6, lines 38-39) with the time spectral pattern vector (time sequences; column 4, lines 53-57 with column 8, lines 10-12), to improve speech recognition and speaker verification.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Morin's processor and method such that is includes a linear discriminant module, to determine the word level

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verification score, which determines the difference between the true speaker or the imposter (column 5, lines 25-46).

Regarding **claim 2**, Morin discloses the speech recognition processor and method, but lacks wherein said linear discriminant vector is computed based upon training utterances using Fisher's linear discriminant analysis.

Gandhi discloses a speech recognition processor and method wherein said linear discriminant vector is computed based upon training utterances (training utterances; column 7, lines 3-6) using Fisher's linear discriminant analysis (column 5, lines 25-49), to discriminate between two classes.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Morin's processor and method such the it uses Fisher's linear discriminant analysis, to discriminate between strings spoken by the speaker and strings spoken by imposters of the speaker (column 6, line 66 – column 7, lines 2), which improves speech recognition and speaker verification (column 1, lines 6-11).

Regarding **claim 3**, Morin discloses the speech recognition processor and method, but lacks wherein said normalized values are computed by taking inclass and out-class training utterances as time spectral patterns and computing the dot product of the time spectral patterns for the training utterances with said linear discriminant vector for generating histograms of the number of occurrences of a specific score for said in-class and out-class training utterances and subtracting normalized scores for the out-class training

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utterances from normalized scores for the in-class utterances to generate a normalization function.

Gandhi discloses the speech recognition processor and method wherein said normalized values (normalized; column 4, lines 53-61) are computed by taking in-class and out-class training utterances (discriminate between two classes; column 5, lines 25-49) as time spectral patterns (time sequences; column 4, lines 53-57 with column 8, lines 10-12) and computing the dot product (dot product; column 6, lines 38-39) of the time spectral patterns for the training utterances (column 7, lines 3-6) with said linear discriminant vector for generating histograms of the number of occurrences of a specific score (score information; column 4, lines 15-20 with column 2, lines 64-65) for said in-class and out-class training utterances (column 2, lines 64-65) and subtracting (difference) normalized scores for the out-class training from normalized scores for the in-class utterances (normalization likelihood score) to generate a normalization function (column 7, lines 33-56), to discriminate between classes.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Morin's processor and method wherein the normalized values are computed by taking in-class and out-class training utterances, to discriminate between strings spoken by the speaker and strings spoken by imposters of the speaker (column 6, line 66 — column 7, lines 2), which improves speech recognition and speaker verification (column 1, lines 6-11).

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Regarding **claim 4**, Morin discloses the speech recognition processor and method wherein said normalization function includes normalization values (normalization values) between +.SIGMA. and -.SIGMA (summation values; column 3, liens 31-40).

Conclusion

- 3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
 - Tufts et al. (U.S. Patent No. 5,926,804) discloses discriminant neural networks.
 - Reaves (U.S. Patent Mo. 5,826,230) discloses a speech detection device.
 - Sammon et al. (U.S. Patent No. 3,755,780) discloses a method for recognizing characters.
- 4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jakieda R Jackson whose telephone number is 703.305.5593. The examiner can normally be reached on Monday through Friday from 7:30 a.m. to 5:00p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris To can be reached on 703. 305.4827. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JRJ September 9, 2004

SUSAN MCFADDEN
PRIMARY EXAMINER

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